Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Federal-State Joint Board on Universal Service	)	CC Docket No. 96-45
	)	
	)	

To: Common Carrier Bureau

FURTHER COMMENTS OF METRICOM, INC.

Metricom, Inc. ("Metricom"), by its attorneys, hereby submits these further comments on specific questions of the Common Carrier Bureau in the above-captioned proceeding.[1/] This proceeding was initiated to adopt regulations under the universal service provisions, Sections 214(e) and 254, of the Telecommunications Act of 1996 (the "1996 Act").[2/] Those sections require the Commission to create specific mechanisms for the advancement and support of universal service, funded by contributions assessed on certain telecommunications providers and paid out according to certain policies and guidelines developed by Congress.

I. SUMMARY OF COMMENTS

In these Further Comments, Metricom responds exclusively to Questions 7, 15, and 23 of the Common Carrier Bureau's specific questions for further comment. Metricom urges the Commission and the Joint Board to consider the significant contribution that wireless

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[1/] *See Common Carrier Bureau Seeks Further Comment on Specific Questions in Universal Service Notice of Proposed Rulemaking*, DA 96-1078 (July 3, 1996).

[2/] Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996), *codified at* 47 U.S.C. § 151 *et. seq.*

technologies can make in bringing the benefits of advanced telecommunications and information services to our nation's schools. Specifically, Metricom believes that any debate should focus on the end result -- bringing information into the classroom -- rather than the means, whether it be inside wiring or wireless technology, by which that goal is achieved.

Second, Metricom urges the Joint Board and the Commission not to appoint a third-party administrator or to require schools to choose from a list of preferred providers and services. These approaches will impose unnecessary administrative burdens and will inevitably exclude innovative, efficient providers of information technologies and services.

Finally, Metricom does not believe the Commission should adopt a fixed-fund approach to universal service for schools, based on some current estimate of costs to install and support information access. Rather, Metricom believes the Commission should adopt a discount rate, and let the schools decide upon the appropriate level of spending.

II. BACKGROUND

Metricom is a young, rapidly expanding, technologically innovative company based in Silicon Valley. Metricom is a pioneer in the development of state-of-the-art, spread spectrum, unlicensed data communications systems operating under Part 15 of the Commission's Rules and Regulations. Metricom's frequency hopping, spread spectrum systems -- at the leading edge of technology -- offer a unique, license-free wireless solution providing cost-effective, intelligent and flexible local and wide area (regional) data communications for a variety of important applications in the public interest.

Metricom's Ricochet wide-area wireless networks are presently deployed at a number of colleges and universities across the country.[3/] Ricochet service is available commercially in the San Francisco Bay Area and will be available soon in Washington, D.C. Ricochet wireless modems are currently in use in more than 100 K-12 classrooms in the San Francisco Bay Area, primarily to access the Internet and commercial online services, send and receive e-mail, and interconnect with the schools' wired local area networks.[4/]

III. ANSWERS TO SPECIFIC QUESTIONS

A. Question 7. Does Section 254(h) contemplate that inside wiring or other internal connections to classrooms may be eligible for universal service support of telecommunications services provided to schools and libraries? If so, what is the estimated cost of the inside wiring and other internal connections?

The Conference report accompanying the Telecommunications Act of 1996 refers several times to connections to classrooms, not school buildings. "New subsection (h) of section 254 is intended to ensure that health care providers for rural areas, elementary and secondary school *classrooms*, and libraries, have affordable access to modern telecommunications services that will enable them to provide medical and education services to all parts of the Nation."[5/] Clearly it is the intent of this provision that there be access to information services at the individual classroom level. However, wireline connections are only one possible means to this end. As

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[3/] Ricochet networks are installed at California Polytechnic University, Oregon State University, San Francisco State University, Stanford University, University of Oregon, University of Miami, University of California at Berkely, and University of California at Santa Cruz. Installation at George Washington University is partially completed. Ricochet modems give students convenient, portable, wireless access to e-mail, Internet, and local area networks.

[4/] Metricom's current educational services and rates are attached as Exhibit A.

[5/] S. Conf. Rep. No. 104-230, 104th Cong. 2d Sess. 132 (1996) (emphasis added).

many have realized, providing inside wiring -- given the current condition of may of the nation's older schools -- may be prohibitively expensive, and may not be the best means to achieve the goal of access to advanced telecommunications and information services in individual classrooms.[6/]

Section 254(h) mandates certain functionalities. It is the task of the Joint Board and the Commission to determine how best to achieve these functionalities. Metricom believes that wireless technologies are an attractive choice for the education information infrastructure for a number of reasons. First, wireless technologies can be significantly less expensive than wired connections in many institutional settings. For example, one Colorado study showed that providing Internet access to 14 rural school districts through wireless networks could save the schools nearly $1 million over a 10 year period over the cost of wired access.[7/]

Second, wireless technologies may mean quicker and simpler deployment of local and wide-area networks than wired connections. Wireless networks are easy to install, implement, and use. Metricom's Ricochet service, for example, offers an all-in-the-box package with Internet access included, and makes initial setup a 30 minute task instead of a major and costly undertaking.

Third, wireless technologies can provide flexibly configured, forward-looking networks that can grow with the needs of the educators and the availability of instructional materials.

[6/] Testimony before the Joint Board has estimated wiring costs at $5 billion, and suggested that wiring may be especially costly in older schools because they may require retrofitting and may contain asbestos. *Communications Daily*, June 20, 1996.

[7/] *See Allocation of Spectrum in the 5 GHz Band to Establish a Wireless Component of the National Information Infrastructure, Comments of the National Science Foundation Wireless Field Test for Education Project* at 3 (1996).

When a wired network is installed, the network bandwidth and the configuration of network workstations and servers is essentially fixed for all time. A wireless network, on the other hand, can expand over time in both bandwidth and in the number of workstations. Initially, installation can be limited to a few workstations which can be moved from place to place as they are needed. Additional workstations can be included at any time; bandwidth improvements can be achieved by upgrading transmission and reception hardware.

Finally, wireless technologies can provide solutions that involve entire communities, not just the schools. Teachers can work at home using portable wireless modems and gain access to school network facilities. Students with temporary or permanent disabilities who are unable to attend classes can use wireless modems at home or in specially equipped locations to benefit from computer-assisted instruction and to prepare and turn in homework assignments. Using wireless network interconnections, parent-teacher groups and interested members of the community can participate in educational oversight and curriculum development, and may take part in a variety of online discussions of educational and community interest.

B. Question 15. What is the least administratively burdensome requirement that could be used to ensure that requests for supported telecommunications services are bona fide requests within the intent of section 254(h)?

Metricom agrees that reducing administrative overhead is an extremely important consideration in designing universal service support mechanisms for education. However, in designing those mechanisms, Metricom urges the Joint Board and the Commission to reject any proposal that requires a new third-party administrator to determine whether or not a request is bona fide. A request should be considered bona fide if it comes from an accredited institution. Nowhere in the legislation is it suggested that a state-level review is required; state level review

of individual requests would impose additional demands on schools and libraries and would be unnecessarily cumbersome

Metricom also urges the Joint Board and the Commission to reject any proposal that would require schools to choose from an approved list of preferred providers and services. Existing contracting procedures used by the school districts should be the only procedures required to make a request for service. The preferred provider approach will limit choice without any concomitant benefit. Smaller providers of innovative, cost-effective solutions will risk being completely excluded from the education technology initiative, or face burdensome, state-by-state administrative processes for inclusion. Likewise, schools will be restricted in their choice to those providers who have met some form of litmus test for inclusion on the list, which may be irrelevant to the schools' specific needs.

Moreover, maintenance of a list of providers and services is not without administrative burden of its own. Access to advanced telecommunications services is a rapidly growing, dynamic field. Today's list of services could be obsolete next month, as changes in technology and the marketplace are reflected in prices and availability of services. Indeed, in such a competitive market, there is no reason for regulators to stimulate information flow at all -- competition ensures that buyers and sellers meet when it is in their mutual best interest to do so.

C. Question 23. Are the cost estimates contained in the McKinsey Report and NII KickStart Initiative an accurate funding estimate for the discount provisions for schools and libraries, assuming that tariffed rates are used as the base prices?

Metricom is gratified to observe that the McKinsey Report figured wireless technologies into its cost estimates.[8/] As that report recognized, wireless alternatives are particularly

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[8/] *See* McKinsey & Co., Connecting K-12 Schools to the Information Superhighway, at 58.

important in the case of older schools and those requiring asbestos abatement, as well as schools in rural districts where wiring -- both inside and outside -- can be prohibitively expensive. However, these cost estimates are only a starting point; a universal service funding methodology must provide for the flexibility to adapt to actual costs as they become available. Locking in numbers based on preliminary estimates can lead to restricted infrastructure development, or inefficient and inappropriate overspending. Rather, regulators should set only the discount level -- the so-called e-rate -- to be funded through universal service support, and let the dynamics of the market determine which services, and what level, is right for the schools. Schools must have the freedom to determine the services they need, and the flexibility to invest in the technology that is appropriate for them.

IV. CONCLUSION

For the foregoing reasons, the Commission should act in accordance with these Further Comments.

Respectfully submitted,

METRICOM, INC.

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Its Attorneys

Dated: August 2, 1996

[redacted]

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to reserve this pricing for your school

Los Gatos High School

Joanne Benjamin
12th Grade Government & Economics Teacher
Los Gatos, CA

"I originally researched the cost of a dedicated phone line to connect our classroom computer to the Internet, but discovered that it was prohibitively expensive. Then I heard about Ricochet and thought, 'Oh, this is so affordable I can have it now!' Since then, Ricochet has opened up a whole new way of teaching for me. In my economics class, for example, students use Ricochet right from the classroom to help them prepare for a stock market simulation game. They use Ricochet to access company web sites to learn about its assets and liabilities. Since our school isn't wired – and I don't imagine it will be for some time – Ricochet has given my students a leg up...now they can use all the resources available to them."

Valley Christian High School

"Ricochet has been a vital resource to me in the classroom. Since we don't have a dedicated computer network in our school, Ricochet enables me to demonstrate to my students the depth of information available on the World Wide Web. Plus, I can leave the Internet up and running all day long without racking up a huge phone bill. And, with Ricochet as my Internet Service Provider, I don't have to worry about being "dropped" during periods of non-activity. After observing how I've been using Ricochet in the classroom, other technology teachers in our district have requested wireless modems and service for their classrooms."

Phil Cripe
Computer Science Teacher
San Jose, CA

Alum Rock Union School District

Bev Junginger
Technology Coordinator

"I've already gotten my money's worth using Ricochet. I use the Ricochet modem and service for about two hours every day to access E-mail messages, teach or do demonstrations. I love using Ricochet because it always connects, is fast and efficient, and can be used anywhere I go in the county."

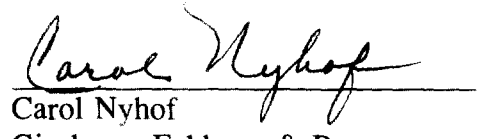
Homestead High School

"I use Ricochet with my personal digital assistant (PDA), which is small enough to be used at my desk without disturbing other students. Ricochet allows me to stay in touch with my dad on E-mail during the school day, work on school assignments with other students and download homework to my home computer for follow-up at night. The more I learn about Ricochet, the more I think, `Wow, this is a great product for anyone!"

Cory Hamma
Senior
Cupertino, CA

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing Further Comments of Metricom, Inc. was served this 2nd day of August, 1996, by first class mail, postage prepaid, or by hand (*) to each person on the attached service list.



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